

Flemish cCMV registry: Threshold variability

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Congenital CMV Registry

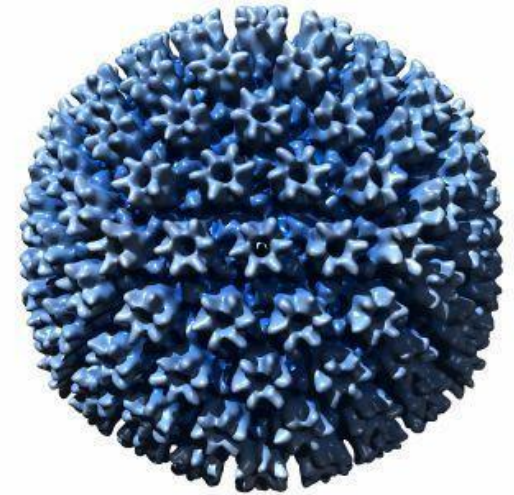
- Prospective follow-up study (2007 -
- Online registration in database (www.cmvreg.be)
- **6 Centres:**

Ghent UH	St. Augustinus Hospital Wilrijk
Antwerp UH	Queen Paola Child Hospital Wilrijk
Leuven UH	St. Jan Hospital Bruges
- Data on:
 - Pregnancy, diagnosis and neonatal investigations
 - Treatment with Ganciclovir/Valganciclovir
 - Audiological, neurological & ophthalmological long-term outcome



cCMV associated hearing loss

- ➔ cCMV associated hearing loss
 - ➔ Exclusively sensorineural
 - ➔ 70% severe to profound
 - ➔ Uni- and bilateral
 - ➔ 15% delayed onset HL
 - ➔ Unstable nature with | progressions
| fluctuations
| improvements



Goderis et al. Hearing Loss and Congenital CMV Infection: A Systematic Review. Pediatrics. 2014.

Definition of symptomatic cCMV

➔ Symptomatic = Abnormality on one or more neonatal investigations:

Physical examination	jaundice, petechial rash, hepatosplenomegaly, microcephaly, dysmaturity, seizures
Central imaging (US/CT/MRI)	calcifications, periventricular cysts, white matter hyperintensity, cortical atrophy, ventriculomegaly, gyration disorders, ..
Hearing test	sensorineural hearing loss
Ophthalmologic examination	chorioretinitis, visual impairment, cataract
Blood tests	thrombopenia, conjugated hyperbilirubinemia, elevated hepatic transaminases

Results August 2014

➔ August 2014: 491 children in the registry
379 included in the analysis

➔ UZ Gent	164
➔ UZ Antwerpen	50
➔ Sint Jan Brugge	26
➔ KU Leuven	93
➔ Sint Augustinus	35
➔ Paola Kinderziekenhuis	11

Baseline characteristics				
		Total group n = 379	Symptomatic n = 123	Asymptomatic n = 256
Total count		100%	33%	67%
Sex	# Boys	55.1%	55.3%	55.1%
	# Girls	44.9%	44.7%	44.9%
Mean age at last follow-up (months)		29.4	27.5	30.3
Mean number of evaluations / child		3.6	4.27	3.29
Seroconversion				
0-13 weeks		32.2%	41%	28.1%
14-27 weeks		22.2%	16.3%	25%
>27 weeks		16.6%	8.1%	20.7%
Unknown		29%	35%	26.2%
Primipara		14.2%	13%	14.8%
Multipara		54.9%	55%	55%
Unknown		30.9%	32.5%	30.1%

Neonatal characteristics

	TOTAL GROUP	SYMPTOMATIC	ASYMPTOMATIC
Mean gestation (w)	38.6	38.1	38.8
Mean birth weight (g)	3244.3	3082.3	3330.8
Mean birth length (cm)	49.5	48.7	49.9
Mean Head circ (cm)	34	33.3	34.3
Reason for screening			
Central imaging	3.4%	8.9%	0.8%
Dysmaturity	3.2%	7.3%	1.2%
Hearing loss	11.1%	28%	3.1%
Known seroconversion	76.5%	60%	84%
Developmental delay	0.3%	0.8%	0
Hematological abnormalities	3.4%	9.8%	0.4%
Other	4.7%	6.5%	3.9%

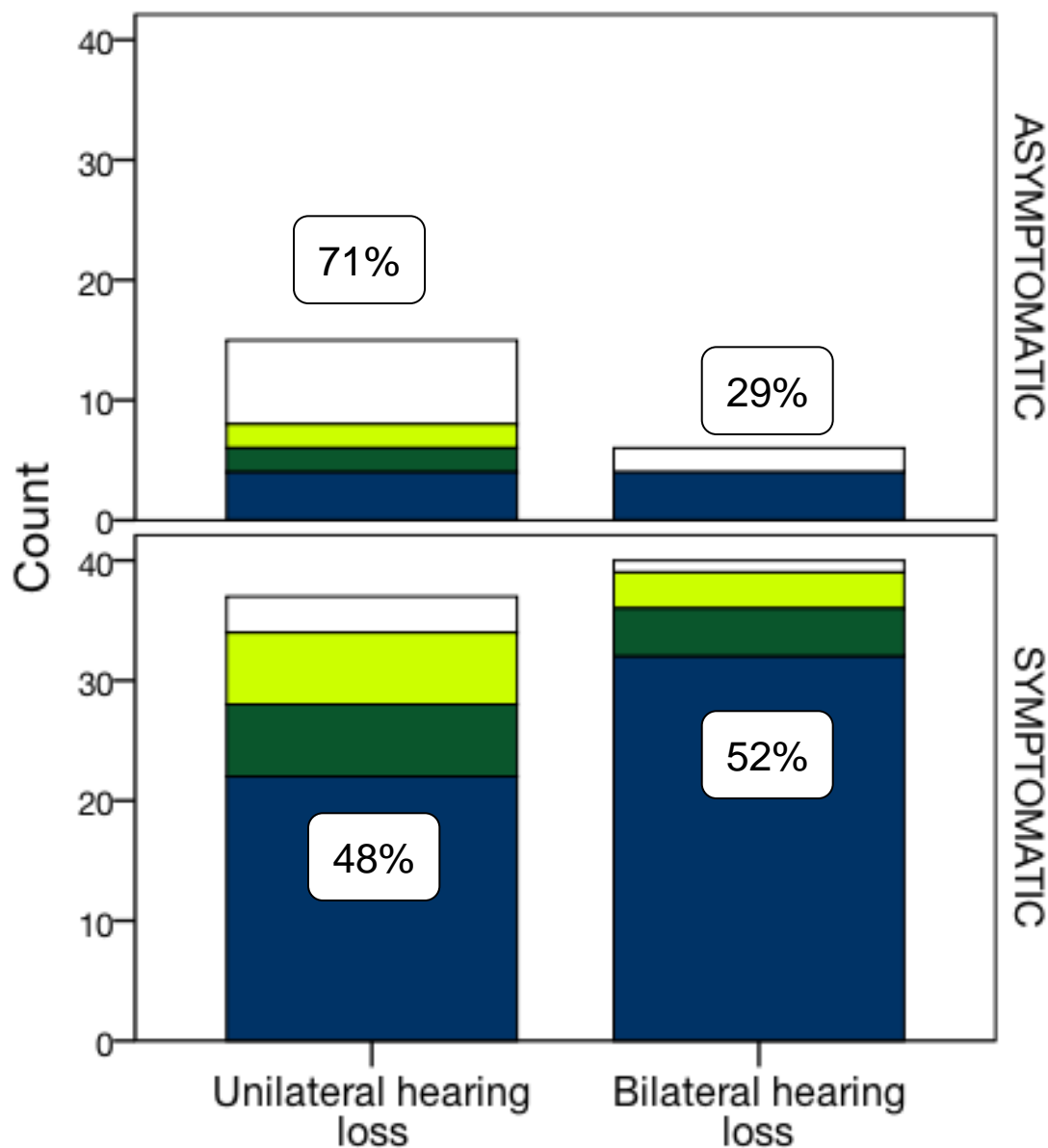
Neonatal characteristics (2)

	TOTAL GROUP	SYMPTOMATIC	ASYMPTOMATIC
Ophthalmologic ex.			
Normal	91.3%	87%	93.4%
Abnormal	0.8%	2%	0
Not performed	7.9%	11.4%	6.3%
Neonatal hearing			
Normal	79.9%	39%	100%
Unilateral hearing loss	10.8%	60%	0
Bilateral hearing loss	9%	0	0
Not known	0.3%	0	0.4%
Treatment			
No treatment	85.2%	54.5%	100%
IV Ganciclovir	6.9%	46%	0%
Oral Valganciclovir	7.9%		

Hearing status at final follow up: Patients

	Normal Hearing	Hearing loss
Total group	74%	26%
Symptomatic	37%	63%
Asymptomatic	92%	8%

Hearing status at final follow up: Patients



Degree of hearing loss (worst ear)

- Mild
- Moderate
- Severe
- Profound

	Normal Hearing	Hearing loss
Total group	74%	26%
Symptomatic	37%	63%
Asymptomatic	92%	8%

Delayed onset hearing loss

	Total group	Symptomatic	Asymptomatic
Patients	9%	11%	8%
Ears	42 (5.5%)	17 (6.9%)	25 (4.9%)

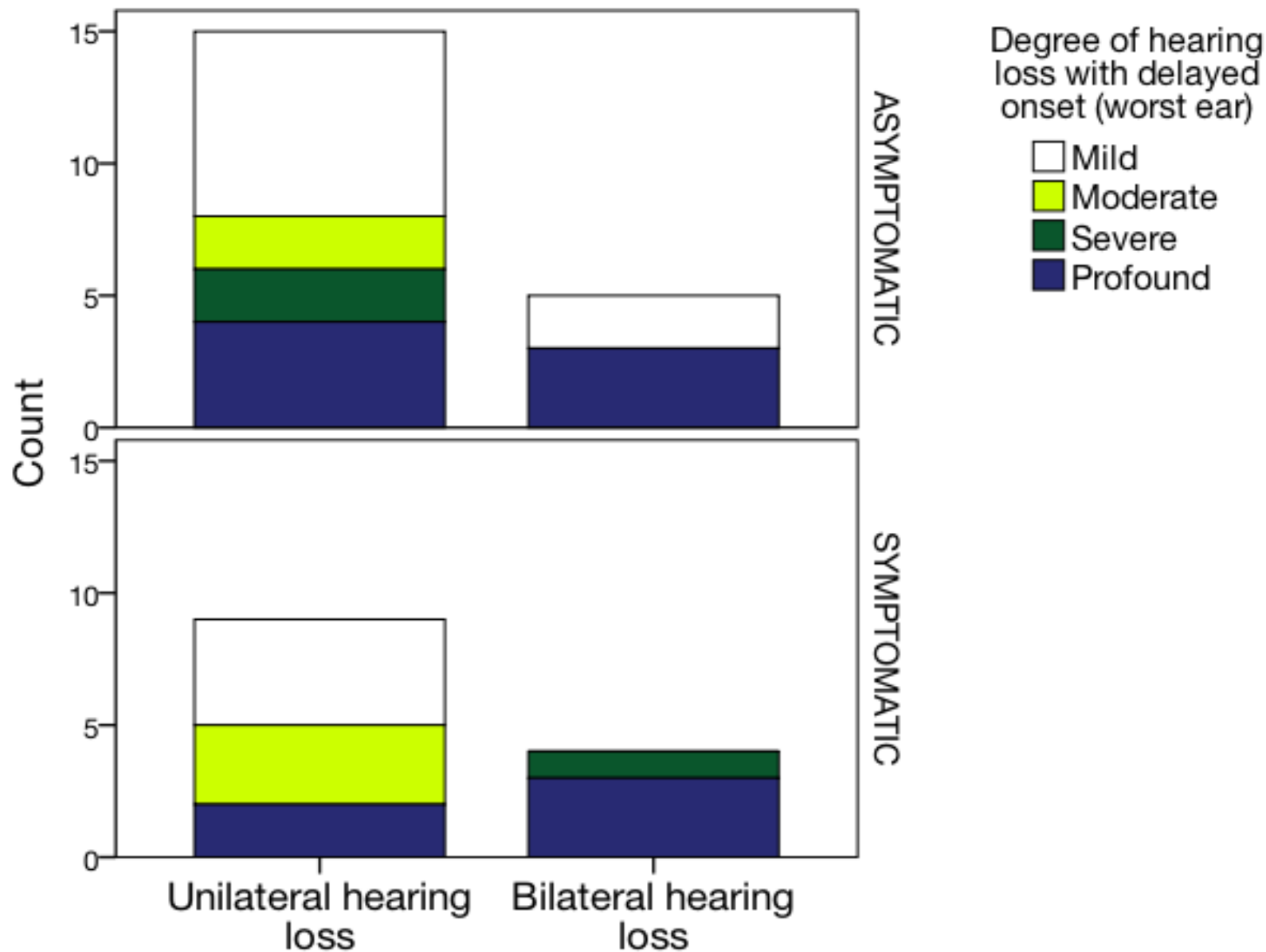
		Total group	Symptomatic	Asymptomatic
Mean age of diagnosis		17.9m	14.6m	20m
Percentiles	25	5m	4.5m	5m
	50	14m	12m	15m
	75	23.8m	21.5m	20m
Range		2 – 61m	2 – 42m	3 – 61m

Delayed onset hearing loss

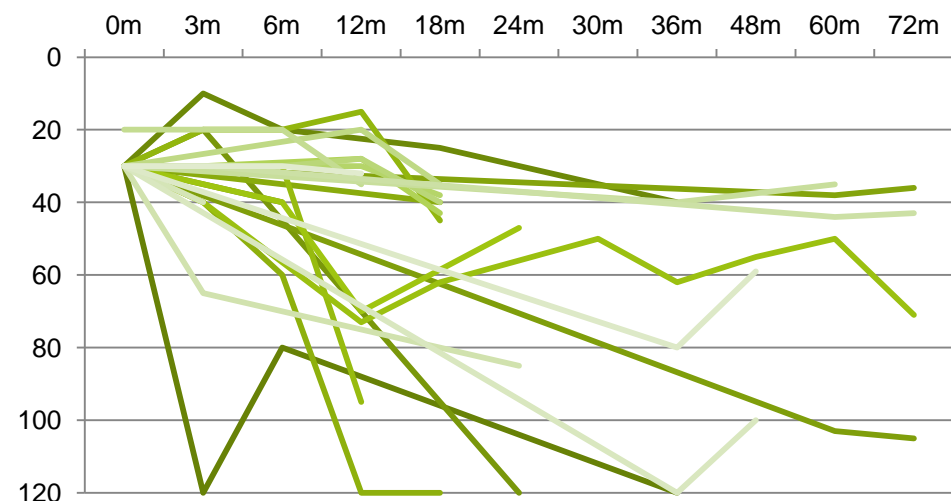
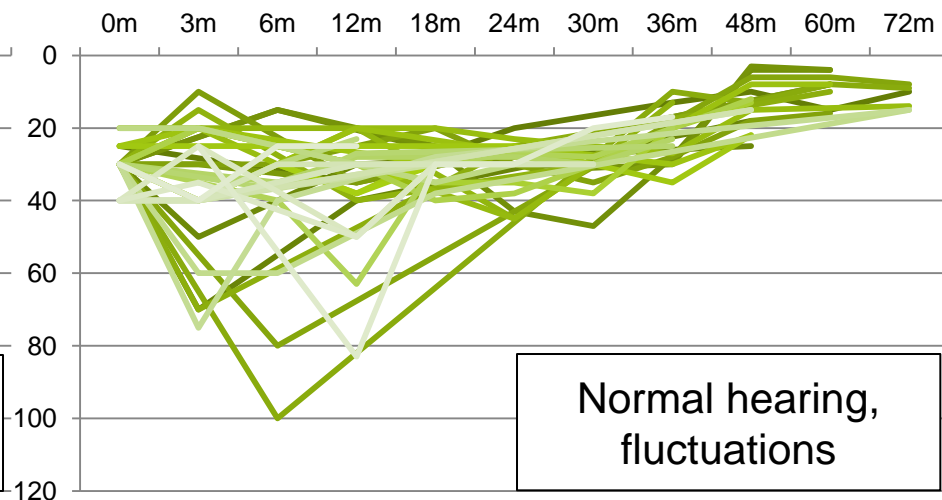
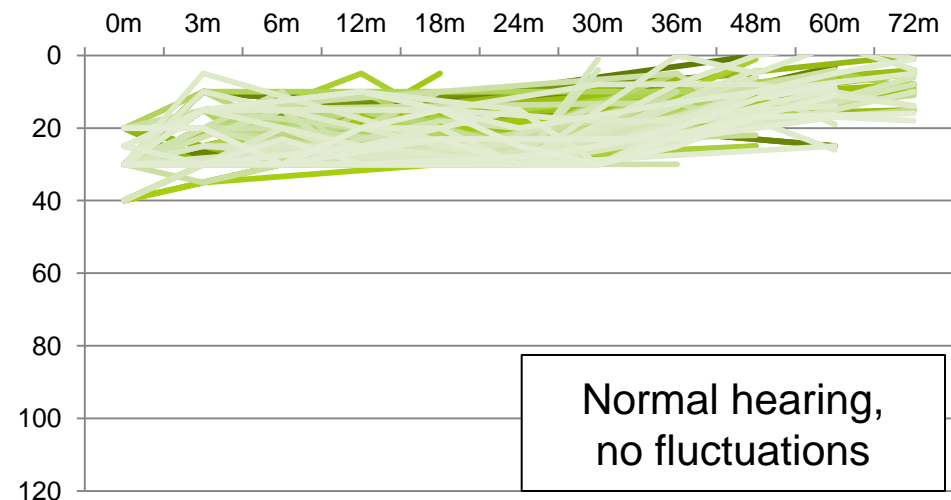
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Delayed onset hearing loss: degree and laterality

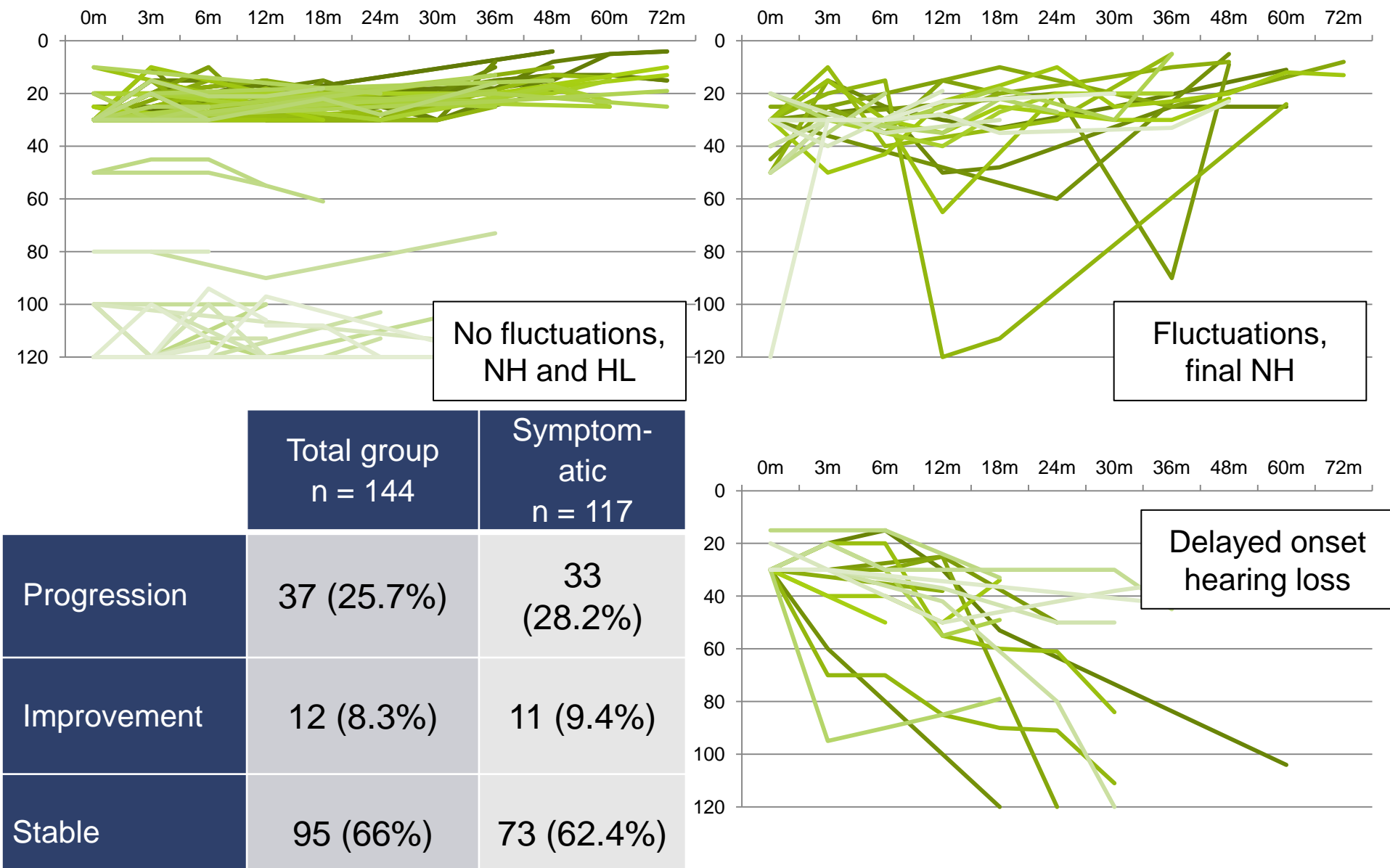


Threshold Variability in asymptomatic ears



	Total group n = 144	Asymptomatic n = 27
Progression	37 (25.7%)	4 (14.8%)
Improvement	12 (8.3%)	1 (3.7%)
Stable	95 (66%)	22 (81.5%)

Threshold Variability in symptomatic ears



Hearing Amplification

	Total group	Symptomatic	Asymptomatic
Hearing aid			
unilateral	7 (2%)	6 (4.9%)	1 (0.4%)
bilateral	9 (2.4%)	8 (6.5%)	1 (0.4%)
Cochlear implant			
unilateral	8 (2.1%)	7 (5.7%)	1 (0.4%)
bilateral	14 (3.7%)	14 (11.4)	0
BAHA (as cros)	1 (0.3%)	1 (0.8%)	0
Total with substitution	38 (10%)	29%	1%

- In 100 cCMV children: 7 hearing aids
10 cochlear implants

Conclusions

- Remarks:
 - Our study: overrepresentation of symptomatic pts (referral bias)
 - Changing definition: **More symptomatic** children (33% <> 10%)
Less long-term **sequelae in the asymptomatic** group
- **Hearing loss** at final evaluation:
 - 26%** of total group
 - 63%** of symptomatic children
 - 8%** of asymptomatic children
- **Degree:** in case of HL **59% Profound** (total group)
 - Symptomatic group: majority with profound loss (65%)
 - Asymptomatic group: majority with mild loss (48%), second largest group profound (33.3%)
- **Laterality:**
 - Symptomatic group: unilateral losses = bilateral losses
 - Asymptomatic group: more unilateral losses

Conclusions

- **Delayed onset:**
 - 9% of all children with cCMV (S>A, 11% <> 8%)
 - Evolution to profound loss in 29%
 - Mean age = 17 months
 - **50% before 14m, 75% before 24m**
- **Unstable** nature with fluctuations > progressions > improvements
 - More in symptomatic group

LONGITUDINAL FOLLOW-UP = MANDATORY!

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● hoofd, hals en zenuwstelsel
Neus-, keel- en oorheelkunde, Hoofd- en halschirurgie
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Thank you for your attention

Questions?